National Institute of Environmental Health Sciences

Hosts as ecological traps for the vector of Lyme disease

Author(s): Keesing F, Brunner J, Duerr S, Killilea M, Logiudice K, Schmidt K, Vuong H, Ostfeld RS

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Abstract:

Vectors of infectious diseases are generally thought to be regulated by abiotic conditions such as climate or the availability of specific hosts or habitats. In this study we tested whether blacklegged ticks, the vectors of Lyme disease, granulocytic anaplasmosis and babesiosis can be regulated by the species of vertebrate hosts on which they obligately feed. By subjecting field-caught hosts to parasitism by larval blacklegged ticks, we found that some host species (e.g. opossums, squirrels) that are abundantly parasitized in nature kill 83-96% of the ticks that attempt to attach and feed, while other species are more permissive of tick feeding. Given natural tick burdens we document on these hosts, we show that some hosts can kill thousands of ticks per hectare. These results indicate that the abundance of tick vectors can be regulated by the identity of the hosts upon which these vectors feed. By simulating the removal of hosts from intact communities using empirical models, we show that the loss of biodiversity may exacerbate disease risk by increasing both vector numbers and vector infection rates with a zoonotic pathogen.

Source: http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2825780

Resource Description

Exposure :

weather or climate related pathway by which climate change affects health

Ecosystem Changes

Geographic Feature:

resource focuses on specific type of geography

None or Unspecified

Geographic Location:

resource focuses on specific location

United States

Health Impact:

specification of health effect or disease related to climate change exposure

Infectious Disease

Infectious Disease: Vectorborne Disease

Vectorborne Disease: Tick-borne Disease

Tick-borne Disease: Lyme Disease

Mitigation/Adaptation: ☑

mitigation or adaptation strategy is a focus of resource

Adaptation

Model/Methodology: ☑

type of model used or methodology development is a focus of resource

Exposure Change Prediction

Resource Type: ☑

format or standard characteristic of resource

Research Article

Timescale: ☑

time period studied

Time Scale Unspecified

Vulnerability/Impact Assessment: ☑

resource focus on process of identifying, quantifying, and prioritizing vulnerabilities in a system

A focus of content